



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: GU1341

Title: Contaminant and Restoration Assessment of Agana Swamp, and Adjacent Waters

Focus Categories: Toxic Substances, Wetlands

Keywords: Risk Assessment, Watershed Management, Wetlands, Pollutants

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Congressional District: N/A

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Abstract

The Agana Swamp is an area of permanent wetland bordering the western shores of central Guam. It is groundwater fed and also receives surface runoff from the surrounding slopes of Sinajana to the southwest and Mongmong to the northeast. Water is drained from the swamp into the coastal belt via the Agana River. The swamp contains a rich diversity of flora and fauna and is a popular fishing ground for many local people. It also lies adjacent to several high-yielding water wells.

In 1995, PCB contaminated soil was discovered in the vicinity of the Agana Power Plant located at the northern edge of the Agana Swamp. Preliminary studies carried out by the US Navy subsequently revealed relatively high levels of PCBs in fish taken from the swamp and adjacent river system. To date, however, there is no definitive link between PCBs in fish from the swamp and the high levels found at the power plant. Indeed, levels found in fish and sediment samples taken from sites close to the power plant were found to be lower than those taken further afield at the headwaters of the Agana River. The discrepancy between the limited data sets therefore implies that the Agana Power Plant may not be the only major source of PCBs into this watershed.

We therefore propose to undertake an intensive regional survey of PCBs in biotic and abiotic components of the Agana Swamp and Agana River systems. The intended study will take two years to complete and will be divided into two phases of approximately equal duration. Funds are sought here to support the initiation of Phase I, which will concentrate on the collection, and analysis of sediments from around the perimeter of the swamp as well as from sites within it. Phase II will focus on the analysis of biotic components from key sites identified during Phase I of the study.

Sediment cores (30 x 5 cm) will be collected at 100 m intervals around the perimeter of the wetland as well as along transect lines (200 m apart) running north to south across the main body of swamp. By this method we estimate that around 150-200 sites will be visited in all. Additional cores will be collected at the mouth

of the Agana River and neighboring sections of Agana Bay. Three cores will be collected within a 3-m diameter circle at each site. Each core will be divided into upper and lower 15-cm sections to determine any differences in contaminant levels with depth. All sediment samples will be analyzed in triplicate for PCBs heavy metals and polycyclic aromatic hydrocarbons (PAHs). The latter contaminant groups were incorporated into the study following recent reports that Agana swamp was used as a dumping ground for military solid and hazardous waste materials at the end of WWII.

The objectives of Phase I of the study are to delineate concentration gradients of the above contaminants within the study area, identify areas of enrichment, and locate primary point sources if they exist. Phase II will identify vulnerable foci within the biota and provide information of value for human and ecological risk assessment purposes as well as a watershed restoration standpoint.